Mercury Checklist for Water and Sewer Treatment Plants

(and related facilities)

Based on a checklist by The Delta Institute
(http://www.chem.unep.ch/mercury/2003-ngo-sub/Delta-Institute/POTW%20Self%20Assessment.doc)

Many mercury-added and –containing devices and chemicals have available substitutes which have no or significantly less mercury, or are less likely to release mercury into the environment. These substitutions should be made to the greatest extent possible.

If items containing mercury cannot be removed because no feasible substitute is available, they should be identified and labeled, and plans should be in place to reduce the hazard of release while the item is in use, and to ensure proper recycling or disposal when you are finished with it.

Priority Sources

Ck	Item
	Temperature sensors, including lab thermometers, hygrometers, equipment thermometers and thermostats
	Barometers and other pressure sensing equipment (including manometers)
	Mercury-containing reagents: a. Mercury analytical standards b. Gas chromatograph sample interferences (elemental mercury) c. Mercury or mercurous chloride, d. Mercury iodide, e. Mercury nitrate, f. Mercury (II) oxide, g. Mercury (II) sulfate, h. Methiolate
	Sodium hypochlorite (bleach) and other bulk chemicals which may be contaminated with mercury (this may require a laboratory analysis of a batch from your supplier)
	Items with mercury bearings, including some balances, meters and equipment with rotational controls (check equipment specifications)
	Bulk mercury for any current or former equipment, usually packaged in glass jars
	Fluorescent and mercury-vapor light bulbs (see below for more information)

Additional sources you may encounter and other details:

1. Laboratory Equipment
   a. Ion exchange cartridges for lab water purification system
   b. Hanging mercury drop electrodes for polarographic analyzers

2. Bulk Chemicals (Not all of these contain mercury, but many have mercury as a contaminant from manufacturing. Read your MSDSs and request additional information from your suppliers if necessary)
   a. Phosphorus removal chemicals
   b. Dechlorination chemicals
   c. Sludge thickening polymers
   d. Potassium hydroxide
   e. Sodium hydroxide
   f. Sodium chloride

g. Chlorine
h. Sodium hypochlorite
i. Sulfuric acid
j. Nitric acid
k. Ferric or ferrous chloride
l. Pickling liquor (for phosphorus removal)

3. Process Control and Measuring Equipment (some of these items may contain large amounts of elemental mercury; use caution when handling)

a. Accustats
b. Barometers
c. Counterweights
d. Elemental mercury for refilling mercury-containing equipment.
e. Flow meters
f. Gas regulators and meters
g. Gyroscopes
h. Hydrometers with thermometers
i. Level and rotation sensors
j. Manometers, pressure gauges and vacuum gauges
k. Mercury-sealed pistons
l. Permeters
m. Pressure-trols
n. Pyrometers
o. Rectifiers
p. Ring balances
q. Shunt trips
r. Steam flow meters
s. Stokes gauges
t. Switches and relays:
    1. displacement plunger relays
    2. mercoid control switches,
    3. pressure control switches (mounted on bourdon tube or diaphragm),
    4. relay switches,
    5. mercury wetted relays,
    6. mercury displacement relays (found in motors)
    7. sump pump, bilge pump and other float controls,
    8. tilt switches.
u. Thermometers (including industrial dial face thermometers with capillary tubes)
v. Thermostats and thermoregulators
w. Transmitters

4. Buildings

a. DC watt-hour meters
b. Flame sensors (found in the pilot light and burner assembly on gas-fired furnaces, boilers, unit heaters and space heaters)
c. Hydronic and warm air controls with tilt switches such as:
    1. aquastats,
    2. pressurestats,
    3. firestats,
    4. fan limit controls
    5. pressure/flow controls on air handling units.

d. Switches and relays:
    1. fire alarm box switches,
    2. silent light switches,
    3. relay switches,
    4. mercury wetted relays,
    5. mercury displacement relays (found in lighting, resistance heating and motors)
    6. sump pump, bilge pump and other float controls,
    7. tilt switches.

e. Thermostats

5. Trickling Filter Pivot Arm Bearings (mercury bearings/water seals)

6. Lamps (because fluorescent lamps are more efficient than incandescent, and electricity generation often produces mercury air pollution, using these lamps is an overall environmental benefit, so long as they are handled properly and recycled)

a. Fluorescent,
b. High-pressure sodium,
c. Mercury arc,
d. Mercury vapor lamps
e. Metal halide,
f. Ultraviolet disinfection

7. Paint

a. Old latex (pre-1990)
b. Marine paint

8. First Aid/Medical

a. Mercurochrome
b. Thimerosal (preservative in some liquid preparations)

9. Other

a. Fleet vehicles may contain ABS, convenience and trunk lighting switches and HID headlamps
b. Old pesticides, fungicides and herbicides
c. Computer monitors and other electronics
d. Batteries, including mercury-zinc (button), mercury-cadmium, mercury alkaline and. Mercury oxide

Additional Notes and References:

- Fluorescent light bulbs are often an environmentally responsible choice. Even though they contain mercury, they use significantly less electricity for the same amount of light and last much longer than conventional incandescent bulbs. Electricity generation can also release mercury into the environment. It is important that fluorescent bulbs are properly handled during and after use. The bulbs can be easily recycled. See: http://www.mass.gov/dep/files/flampbiz.htm for information on handling and recycling of bulbs. State contracts with mercury lamp recyclers are available; see FAC 26 on http://www.comm-pass.com/.

- The state's Operational Services Division (OSD) also has a program for Environmentally Preferable Purchasing (EPP), at http://www.mass.gov/epp/enviro.htm. Here, you can find information on purchasing equipment and supplies with reduced or no mercury added.

- Mercury-free bleaches and other cleaners are available.

Mercury Policies and Procedures at Your Facility

The following checklist, adapted for sewage treatment plants from the Ohio EPA *Mercury Challenge Handbook* (for medical facilities), can be used to evaluate and improve your mercury reduction efforts.

Does your facility--

1. Have a policy regarding the purchase of mercury-containing equipment and products?
2. Track or have an inventory form for mercury containing equipment and products?
3. Have a policy on how to clean up a mercury spill?
4. Train staff in preventing and cleaning up mercury spills?
5. Have procedures for cleaning and refilling instruments containing mercury?
6. Label equipment that contains mercury?
7. Recycle mercury parts when you replace old equipment? (e.g., switches)
8. Require the manufacturer or vendor to disclose mercury content or concentration?
9. Have a policy to ensure mercury products are not disposed of down the drain or in the garbage?
10. Clean mercury out of traps, sumps and sewer lines?
11. Recycle spent fluorescent lamps and other lamps that contain mercury?
12. Recycle batteries containing mercury?